

Digital Currency: Unfolding of Bitcoin

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Introduction

The inception of bitcoin in 2008 by Satoshi Nakamoto has been one of the major innovations in electronic payment systems worldwide. Bitcoin is a form of digital currency which is created and held electronically. They are not printed like any other currency but are produced electronically by making use of computational power of computer by using mathematical problems (Nakamoto, 2008).

The most revolutionary feature of Bitcoin is that it is one of the first decentralized currencies, which is not created by any government, not even a country. The history of bitcoin is so interesting and controversial in some aspects that people have started to believe that it heralds next digital revolution. Bitcoin is a digital asset and a payment system that enables peer-to-peer transaction between the users directly, without any intermediary. The disintermediation results in huge savings in the transaction cost.

The transactions between people are recorded in a publicly distributed ledger called the blockchain. Blockchain contains records of every single bitcoin transaction ever made. The public can find out who owns a bitcoin, where they spent it, and exactly how much was spent. The blockchain provides anonymity, though not complete anonymity. The bitcoin transactions on the blockchain will have the account holder's unique number and not their name. This keeps people's identities protected while also offering a surprisingly effective public information system. The blockchain is formed using individual computing power from any person's computer. This person is actually someone who allows the blockchain to use their computing

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power and effectively keep a record of the bitcoin transactions along with supporting the bitcoin software. Anyone who allows their own computing power to be used for the purpose of maintaining the blockchain gets a fraction or percentage of every new bitcoin that is mined. Blockchain offers a secured payment network which is anonymous. This mechanism ensures authenticity of each transaction, prevents double-counting of bitcoin tokens that has been an issue with many digital currencies. Also, the immense computing power required to mine bitcoin makes it almost impossible to duplicate a transaction block and commit fraud.

Unlike fiat currency that is created by mining metal coins, bitcoins are mined using mathematics. The algorithm makes use of a private key while the verification process makes use of a public key. Once these keys are mined, a new bitcoin is created. This does not mean that infinite bitcoins can be created. The algorithm is such that Satoshi Nakamoto ensured that the total number of bitcoins mined would remain limited to 21 million bitcoins. The total number of bitcoins mined is programmed to reduce by half every year, until the number of bitcoins reaches 21 million. The limited number of bitcoins, however, are perfectly divisible. They can be used to make micropayments. A millibitcoin is 10^{-3} , 10^{-6} is a microbitcoin and 10^{-8} is a Satoshi.

The bitcoin ecosystem consists of exchanges that permit trading between bitcoins and traditional currencies, the transaction service providers that help individuals to store in bitcoin wallets and transact their bitcoins via their bitcoin client software and the bitcoin miners. Bitcoins can be purchased over the exchange from an individual or at a bitcoin ATM. With its features of deregulated currency that promises anonymity, reduction in transaction costs and safety, Bitcoin has been gaining popularity in the world that is treading to a cashless and digital society. There is an increase in the acceptance of bitcoins as medium of exchange throughout the world that will result in an increase in its volume to couple the increasing value of bitcoins. It is expected to soon overcome the transactions via credit cards and debit cards.

Despite the growing popularity, it has become cynosure of the critiques. The anonymity of transactions puts a question on credibility of transactions taking place in bitcoins. Bitcoin price has been volatile since 2013 where the price spiked from approximately \$10 to \$1163 in the same year and then falling gradually to the \$200s. Again a very high volatility was witnessed in 2016 owing mainly to the devaluation of Chinese currency, Yuan, as an escape response to the tight capital controls. In early 2017 bitcoin price hit to all-time high at \$1140. Many bitcoin

exchanges have shut overnight. Mt. Gox, one of the world's first bitcoin exchanges that once accounted for 80% of trading volumes shut down after operating for four years due to the heightened speculation. The question on reliability of bitcoin has put the governments away to grant it a legal status.

Amidst the growing popularity of bitcoin, it has failed to attract the attention of researchers. Scant empirical literature exists on examining the factors that impact the bitcoin price and its returns and its relationship with different market and economic factors. Survival analysis conducted by Moore and Christin (2013) on 40 Bitcoin exchanges reveal that out of 40 exchanges 18 had shut with popular exchanges more likely to suffer a security breach. They found a negative correlation between average transaction volume of an exchange and probability of closing prematurely. Baek and Elbeck (2015) studied the effect of select macro-economic variables on Bitcoin market returns and concluded that volatility in Bitcoin market is internally driven indicating presence of high speculation. External economic factors were not found to exert any significant impact on Bitcoin market returns. Bagdev and Chen (2014) empirically analyzed the general patterns of Bitcoin usage, and examined the use of Bitcoin for investment and payment purposes. They found bare evidence to suggest usage of bitcoin as a medium of exchange. Raskin and Yermack (2016) concluded that digital currency may have insightful implications for the banking system and it is quite possible that central banks of different countries might launch their own regulated digital currencies. Polasik et al. (2015) found that company structures, use of payment methods, customers' knowledge about Bitcoin, and size of economy had a significant bearing on Bitcoin returns. The review of literature indicates that the studies on this new phenomenon are at a nascent stage and especially lacks empirical analysis in academia and an in-depth understanding of this new economic instrument.

Recent events such as slashing of interest rate by European Central Bank (ECB), devaluation of Yuan, Britain's exit from EU, demonetization of Indian currency had caused spikes in bitcoin's price. A high volatility in bitcoin prices has questioned its usage as a currency. People have been buying bitcoin as a speculative investment which makes it difficult to be used as a medium of exchange. Coupled with the fact this alternative investment avenue came at a time when the world witnessed a financial crisis in 2008 makes it worthwhile to have some

empirical studies on the impact of economic factors on bitcoin prices and returns. Bitcoin arose to combat the crisis situation and emerged as an alternative investment vehicle rather than as an alternative medium of exchange. World over it is observed that when an economy faces turmoil, bitcoin's popularity increases. However, it is quite possible that bitcoin may put the economy in a downward spiral. Growing demand with limited supply is resulting in a continuous growth in bitcoin's value without any supporting logic that may hint a bubble in the market that may burst.

People have been hoarding it with a belief that its price shall increase further. This is evident from fewer volumes of transactions in bitcoin. Also, the anonymity in transactions may put a veil on investment in illegal activities, money laundering and flight of capital. So, what began as an escape response to the turmoil in the economy may further push the economy in a spiral. Thus, there lies immense scope to investigate the macroeconomic factors that affect bitcoin prices and returns.

The regulatory environment of a country is an important factor to determine the adoption of bitcoin by people. Stringent regulations may cause potential investors to invest more in bitcoin and escape the regulations. This is precisely is happening in China as Chinese government has strict capital controls. On the other hand, regulations of a country may be such that investments in bitcoin may be tightened or banned. Besides the regulatory aspect, the development of financial market may have an impact on the adoption of bitcoin. A well-developed financial market may reduce the reliance on bitcoin. However, if bitcoin's volatility is controlled due to well developed markets it may emerge as a medium of exchange which is digital and shall help the economy to become cashless. The economic environment may have an impact on adoption on bitcoin. The birth of bitcoin in post-crisis period indicates that it may be used to overcome economic irregularities.

The legal environment is yet another important factor that may impact bitcoin's adoption and usage. Hence, a comprehensive framework that analyzes various levels of macroeconomic factors should be assessed to determine what impacts the popularity of bitcoin. An event study of the various spikes in bitcoin's tenure since 2009 is also a promising avenue of future research.

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